What is claimed is:

1. A sequential method for integrated, in-situ modification of a substrate and subsequent atomic layer deposition of a thin film onto said substrate in an evacuated chamber beginning with initial modification steps, comprising:

introducing at least one first ion generating feed gas into said chamber;

generating a plasma from said ion generating feed gas to form ions;

exposing said substrate to said ions;

modulating said ions;

reacting said substrate with said modulated ions to remove any contaminants from said substrate and producing a modified substrate; and

following said initial modification steps, performing an atomic layer deposition of a thin film onto said modified substrate in said chamber including:

introducing a first reactant gas into said chamber;

adsorbing at least one monolayer of said first reactant gas onto said modified substrate;

evacuating any excess said first reactant gas from said chamber;

introducing at least one additional ion generating feed gas into said chamber, said additional ion generating feed gas ~~may be~~ is the same feed gas as said first ion generating feed gas;

generating a second plasma from said additional ion generating feed gas to form additional ions;

exposing said modified substrate to said additional ions;

modulating said additional ions; and

reacting said adsorbed monolayer of said first reactant gas with said modulated additional ions to deposit said thin film.

2. The sequential method of claim 1 wherein said initial modification steps are cleaning steps.

3. The sequential method of claim 1 wherein said initial modification steps are surface treatment steps.

4. The sequential method of claim 1 wherein said initial modification steps additionally include introducing at least one radical generating feed gas into said chamber and generating a plasma from said radical generating feed gas to form radicals.

5. The sequential method of claim 1 wherein said atomic layer deposition steps additionally include introducing at least one radical generating feed gas into said chamber and generating a plasma from said radical generating feed gas to form radicals.

6. The sequential method of claim 1 wherein said contaminants comprise native oxides, metal oxides, particulate contamination, and carbon-containing impurities.

7. The sequential method of claim 1, wherein said ion modulation is modulated in a way selected from the group consisting of modulating an ion flux and modulating an ion energy.

8. The sequential method of claim 1, further comprising electrically biasing said substrate to a negative potential.

9. The sequential method of claim 8, wherein said electrical bias is induced by a radio frequency power supply.

10. The sequential method of claim 8, wherein a magnitude of said electrical bias during said initial cleaning steps is lower than a magnitude of said electrical bias during said atomic layer deposition steps.

11. The sequential method of claim 1 wherein said method is repeated for each film deposition layer.

12. The sequential method of claim 1 wherein a barrier material film is deposited following said initial modification steps.

13. The sequential method of claim 1 wherein a copper seed layer is deposited following said initial modification steps.

14. A sequential method for integrated, in-situ modification of a substrate and subsequent atomic layer deposition of a thin film onto said substrate in an evacuated chamber beginning with initial modification steps, comprising:

introducing at least one first radical generating feed gas into said chamber;

generating a plasma from said radical generating feed gas to form radicals;

exposing said substrate to said radicals;

reacting said substrate with said radicals to remove any contaminants from said substrate and producing a modified substrate; and

following said initial modification steps, performing an atomic layer deposition of a thin film onto said modified substrate in said chamber including:

introducing a first reactant gas into said chamber;

adsorbing at least one monolayer of said first reactant gas onto said modified substrate;

evacuating any excess said first reactant gas from said chamber

introducing at least one additional radical generating feed gas into said chamber, said additional radical generating feed gas ~~may be~~ is the same feed gas as said first radical generating feed gas;

generating a second plasma from said additional radical generating feed gas to form additional radicals;

exposing said modified substrate to said additional radicals; and

reacting said adsorbed monolayer of said first reactant gas with said additional radicals to deposit said thin film.

15. The sequential method of claim 14 wherein said initial modification steps are cleaning steps.

16. The sequential method of claim 14 wherein said initial modification steps are surface treatment steps.

17. The sequential method of claim 14 wherein said atomic layer deposition steps additionally include introducing at least one ion generating feed gas into said chamber and generating a plasma from said ion generating feed gas to form ions.

18. The sequential method of claim 14 wherein said contaminants comprise native oxides, metal oxides, particulate contamination, and carbon-containing impurities.

19. The sequential method of claim 14 wherein said method is repeated for each film deposition layer.

20. The sequential method of claim 14 wherein a barrier material film is deposited following said initial modification steps.

21. The sequential method of claim 14 wherein a copper seed layer is deposited following said initial modification steps.

22. A single-module system for atomic layer deposition of a film onto a substrate, comprising:

a main chamber containing a plasma generation chamber for generating a plasma, said main chamber also containing an integrated cleaning and deposition chamber for cleaning said substrate and depositing said film on said substrate;

said plasma generation chamber coupled to receive at least one feed gas to form said plasma; and

said integrated cleaning and deposition chamber coupled to receive at least one precursor gas.